

METHANE HYDRATE RESEARCH AND DEVELOPMENT ACT  
OF 1999

---

OCTOBER 18, 1999.—Committed to the Committee of the Whole House on the State  
of the Union and ordered to be printed

---

Mr. YOUNG of Alaska, from the Committee on Resources,  
submitted the following

REPORT

[To accompany H.R. 1753]

[Including cost estimate of the Congressional Budget Office]

The Committee on Resources, to whom was referred the bill (H.R. 1753) to promote the research, identification, assessment, exploration, and development of methane hydrate resources, and for other purposes, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

The amendment is as follows:

Strike out all after the enacting clause and insert in lieu thereof the following:

**SECTION 1. SHORT TITLE.**

This Act may be cited as the “Methane Hydrate Research and Development Act of 1999”.

**SEC. 2. DEFINITIONS.**

In this Act:

(1) **CONTRACT.**—The term “contract” means a procurement contract within the meaning of section 6303 of title 31, United States Code.

(2) **COOPERATIVE AGREEMENT.**—The term “cooperative agreement” means a cooperative agreement within the meaning of section 6305 of title 31, United States Code.

(3) **DIRECTOR.**—The term “Director” means the Director of the National Science Foundation.

(4) **GRANT.**—The term “grant” means a grant awarded under a grant agreement, within the meaning of section 6304 of title 31, United States Code.

(5) **INSTITUTION OF HIGHER EDUCATION.**—The term “institution of higher education” means an institution of higher education, within the meaning of section 1201(a) of the Higher Education Act of 1965 (20 U.S.C. 1141(a)).

(6) **METHANE HYDRATE.**—The term “methane hydrate” means a methane clathrate that—

- (A) is in the form of a methane-water ice-like crystalline material; and
- (B) is stable and occurs naturally in deep-ocean and permafrost areas.
- (7) SECRETARY.—The term “Secretary” means the Secretary of Energy, acting through the Assistant Secretary for Fossil Energy.
- (8) SECRETARY OF COMMERCE.—The term “Secretary of Commerce” means the Secretary of Commerce, acting through the Administrator of the National Oceanic and Atmospheric Administration.
- (9) SECRETARY OF DEFENSE.—The term “Secretary of Defense” means the Secretary of Defense, acting through the Secretary of the Navy.
- (10) SECRETARY OF THE INTERIOR.—The term “Secretary of the Interior” means the Secretary of the Interior, acting through the Director of the United States Geological Survey and the Director of the Minerals Management Service.

**SEC. 3. METHANE HYDRATE RESEARCH AND DEVELOPMENT PROGRAM.**

- (a) IN GENERAL.—
  - (1) COMMENCEMENT OF PROGRAM.—Not later than 180 days after the date of enactment of this Act, the Secretary, in consultation with the Secretary of Commerce, the Secretary of Defense, the Secretary of the Interior, and the Director, shall commence a program of methane hydrate research and development.
  - (2) DESIGNATIONS.—The Secretary, the Secretary of Commerce, the Secretary of Defense, the Secretary of the Interior, and the Director shall designate individuals to carry out this section.
  - (3) MEETINGS.—The individuals designated under paragraph (2) shall meet not later than 120 days after the date on which all such individuals are designated and not less frequently than every 120 days thereafter to—
    - (A) review the progress of the program under paragraph (1); and
    - (B) make recommendations on future activities to occur subsequent to the meeting.
- (b) GRANTS, CONTRACTS, COOPERATIVE AGREEMENTS, INTERAGENCY FUNDS TRANSFER AGREEMENTS, AND FIELD WORK PROPOSALS.—
  - (1) ASSISTANCE AND COORDINATION.—The Secretary may award grants or contracts to, or enter into cooperative agreements with, institutions of higher education and industrial enterprises to—
    - (A) conduct basic and applied research to identify, explore, assess, and develop methane hydrate as a source of energy;
    - (B) assist in developing technologies required for efficient and environmentally sound development of methane hydrate resources;
    - (C) undertake research programs to provide safe means of transport and storage of methane produced from methane hydrates;
    - (D) promote education and training in methane hydrate resource research and resource development;
    - (E) conduct basic and applied research to assess and mitigate the environmental impacts of hydrate degassing (including both natural degassing and degassing associated with commercial development); and
    - (F) develop technologies to reduce the risks of drilling through methane hydrates.
  - (2) COMPETITIVE MERIT-BASED REVIEW.—Funds made available under paragraph (1) shall be made available based on a competitive merit-based process.
- (c) CONSULTATION.—The Secretary shall establish an advisory panel consisting of experts from industry, institutions of higher education, and Federal agencies to—
  - (1) advise the Secretary on potential applications of methane hydrate;
  - (2) assist in developing recommendations and priorities for the methane hydrate research and development program carried out under subsection (a)(1); and
  - (3) report to the Congress within 2 years after the date of the enactment of this Act, or at such later date as the Secretary considers advisable, on the impact on global climate change from methane hydrate extraction and consumption.
- (d) LIMITATIONS.—
  - (1) ADMINISTRATIVE EXPENSES.—Not more than 5 percent of the amount made available to carry out this section for a fiscal year may be used by the Secretary for expenses associated with the administration of the program carried out under subsection (a)(1).
  - (2) CONSTRUCTION COSTS.—None of the funds made available to carry out this section may be used for the construction of a new building or the acquisition, expansion, remodeling, or alteration of an existing building (including site grading and improvement and architect fees).

(e) RESPONSIBILITIES OF THE SECRETARY.—In carrying out subsection (b)(1), the Secretary shall—

- (1) facilitate and develop partnerships among government, industry, and institutions of higher education to research, identify, assess, and explore methane hydrate resources;
- (2) undertake programs to develop basic information necessary for promoting long-term interest in methane hydrate resources as an energy source;
- (3) ensure that the data and information developed through the program are accessible and widely disseminated as needed and appropriate;
- (4) promote cooperation among agencies that are developing technologies that may hold promise for methane hydrate resource development; and
- (5) report annually to Congress on accomplishments under this section.

#### SEC. 4. AMENDMENTS TO THE MINING AND MINERALS POLICY ACT OF 1970.

Section 201 of the Mining and Minerals Policy Act of 1970 (30 U.S.C. 1901) is amended—

- (1) in paragraph (6)—
  - (A) in subparagraph (F), by striking “and” at the end;
  - (B) by redesignating subparagraph (G) as subparagraph (H); and
  - (C) by inserting after subparagraph (F) the following:
 

“(G) for purposes of this section and sections 202 through 205 only, methane hydrate; and”;
- (2) by redesignating paragraph (7) as paragraph (8); and
- (3) by inserting after paragraph (6) the following:
 

“(7) The term ‘methane hydrate’ means a methane clathrate that—

  - “(A) is in the form of a methane-water ice-like crystalline material; and
  - “(B) is stable and occurs naturally in deep-ocean and permafrost areas.”.

#### SEC. 5. AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated to the Secretary of Energy to carry out this Act—

- (1) \$5,000,000 for fiscal year 2000;
- (2) \$11,000,000 for fiscal year 2001;
- (3) \$11,000,000 for fiscal year 2002;
- (4) \$12,000,000 for fiscal year 2003; and
- (5) \$12,000,000 for fiscal year 2004.

Amounts authorized under this section shall remain available until expended.

#### SEC. 6. SUNSET.

Section 3 of this Act shall cease to be effective after the end of fiscal year 2004.

### PURPOSE OF THE BILL

The purpose of H.R. 1753 is to promote the research, identification, assessment, exploration and development of methane hydrate resources.

### BACKGROUND AND NEED FOR LEGISLATION

Methane hydrates are a temperature- and pressure-sensitive chemical mixture of water and methane gas that can exist as a stable, crystalline (ice) form above the normal freezing point of water. Other gases, such as propane, are also found in hydrate form, but the predominant gas is usually methane. The hydrate chemical structure is conducive to the storage of large volumes of gas. A single unit of hydrate, when heated and depressurized, can release up to 160 times its volume in gas.

Sediments under the pressure of hundreds of meters of water in the oceanic continental shelf of the United States are thought to contain significant deposits of methane hydrates. Significant hydrate deposits have also been identified at shallower depths in the permafrost areas of the Alaskan North Slope. The cold climate in this region allows hydrates to remain stable at depths as shallow as 200 meters. The hydrate-bearing sediments in both permafrost

and coastal areas may be several hundred meters thick. In addition to the solid-crystalline hydrate deposits, free methane gas is often encountered below sediments containing hydrates because the hydrate layers can act as a geologic trap for the gas. Natural, catastrophic release of hydrates has been implicated by scientists as leading to regional instability of the sea floor, resulting in large-scale submarine landslides and slumps. The sudden, large-scale degassing of hydrates related to these events could also release vast amounts of methane into the oceans and atmosphere. Methane is considered to be ten times more potent than carbon dioxide as a greenhouse gas; thus, large releases could potentially contribute to climate change.

Preliminary estimates of U.S. methane hydrate resources in 1997 using information from the Ocean Drilling Program suggest reserves of approximately 200,000 trillion cubic feet of gas, which is over a hundred times greater than the estimated 1,400 trillion cubic feet of conventional gas resources.

H.R. 1753 is intended to stimulate research and development efforts of the federal government in partnership with industry and academia to shorten the time frame in which methane hydrates are expected to contribute directly to our domestic energy supply. Furthermore, the benefits of such research and development efforts will very likely be first applied in technology enhancements for conventional petroleum exploration and production, i.e., reduction of hazards which methane hydrates represent today to outer continental shelf oil and gas operators who may penetrate gas hydrate zones in the course of drilling deeper targets. Thus, the Committee believes the expenditures authorized in this bill will be repaid to the Nation in the form of increased energy independence through utilization of this special form of the "fuel of the future."

#### COMMITTEE ACTION

H.R. 1753 was introduced on May 11, 1999, by Congressman Michael Doyle (D-PA). The bill was referred to the Committee on Science, and additionally to the Committee on Resources. Within the Committee on Resources, the bill was referred to the Subcommittee on Energy and Mineral Resources. On May 25, 1999, the Subcommittee held a hearing on the bill. Mr. Doyle testified in support of the bill and the potential for methane hydrates to contribute to the Nation's future energy needs. The Principal Deputy Assistant Secretary for Fossil Energy, Mr. Robert Kripowitz, and Dr. Timothy Collet from the United States Geological Survey testified for the Administration in strong support of the bill. Other witnesses included representatives from the National Science Foundation, and the Directors of the three Marine Minerals Research Institutes.

On June 17, 1999, the Full Resources Committee met to consider the bill. The Subcommittee on Energy and Mineral Resources was discharged from further consideration of the bill was unanimous consent. Congresswoman Barbara Cubin (R-WY) offered an en-bloc amendment to add the Secretary of Commerce, acting through the Director of the National Oceanographic and Atmospheric Administration, in a consultative role, as well as add the Minerals Management Service to the section defining the Secretary of the Interior's

consultative role with the Secretary of Energy. The latter provision more directly incorporates the involvement of the Marine Minerals Research Institutes. The amendment also required the Secretary of Energy to establish an advisory committee of experts from industry, academia and federal agencies. Lastly, the amendment revised the authorization for appropriations in the bill to coincide with the most recent recommendations of the President's Council of Advisors on Science and Technology. The amendment was adopted by a voice vote. Congressman Jay Inslee (D-WA) offered an amendment to direct the Secretary of Energy to report to Congress within one year on the effect of methane hydrate production on global climate change. Mrs. Cubin offered an amendment to the Inslee amendment to extend the time for the report to two years. The Cubin amendment was adopted by voice vote and the Inslee amendment, as amended, was adopted by voice vote. The bill as amended was then ordered favorably reported to the House of Representatives by voice vote.

#### SECTION-BY-SECTION ANALYSIS

##### *Section 1. Short title*

Section 1 is the short title of the bill.

##### *Section 2. Definitions*

Section 2 defines nine terms as used in the bill.

##### *Section 3. Methane hydrate research and development program*

Section 3 outlines the development of the methane hydrate research and development program; provides for the awarding of grants, contracts, cooperative agreements, interagency funds transfer agreements, and field work proposals; limits the amount of administrative funds to 5 percent of the amount to carry out the section, and prohibits the use of funds for building costs.

##### *Section 4. Amendments to the Mining and Minerals Policy Act*

Section 4 amends the Mining and Minerals Policy Act of 1970 to provide that the Marine Minerals Research Institutes may legitimately be funded to perform gas hydrates studies by defining methane hydrates as a "mineral."

##### *Section 5. Authorization of appropriations*

Section 5 authorizes federal appropriations for methane hydrate research at increasing levels from \$5 million in fiscal year 2000 to \$12 million in fiscal year 2004. These authorized levels are consistent with the levels recommended by the President's Council of Advisors on Science and Technology through 2003. The \$12 million authorized for 2004 is a projected level consistent with the level for 2003.

#### COMMITTEE OVERSIGHT FINDINGS AND RECOMMENDATIONS

Regarding clause 2(b)(1) of rule X and clause 3(c)(1) of rule XIII of the Rules of the House of Representatives, the Committee on Resources' oversight findings and recommendations are reflected in the body of this report.

## CONSTITUTIONAL AUTHORITY STATEMENT

Article I, section 8 and Article IV, section 3 of the Constitution of the United States grant Congress the authority to enact this bill.

## FEDERAL ADVISORY COMMITTEE STATEMENT

The functions of the proposed advisory committee authorized by this bill are not currently being nor could they be performed by one or more agencies, an advisory group already in existence or by enlarging the mandate of an existing advisory committee.

## COMPLIANCE WITH HOUSE RULE XIII

1. *Cost of Legislation.*—Clause 3(d)(2) of rule XIII of the Rules of the House of Representatives requires an estimate and a comparison by the Committee of the costs which would be incurred in carrying out this bill. However, clause 3(d)(3)(B) of that rule provides that this requirement does not apply when the Committee has included in its report a timely submitted cost estimate of the bill prepared by the Director of the Congressional Budget Office under section 402 of the Congressional Budget Act of 1974.

2. *Congressional Budget Act.*—As required by clause 3(c)(2) of rule XIII of the Rules of the House of Representatives and section 308(a) of the Congressional Budget Act of 1974, this bill does not contain any new budget authority, spending authority, credit authority, or an increase or decrease in revenues or tax expenditures.

3. *Government Reform Oversight Findings.*—Under clause 3(c)(4) of rule XIII of the Rules of the House of Representatives, the Committee has received no report of oversight findings and recommendations from the Committee on Government Reform on this bill.

4. *Congressional Budget Office Cost Estimate.*—Under clause 3(c)(3) of rule XIII of the Rules of the House of Representatives and section 403 of the Congressional Budget Act of 1974, the Committee has received the following cost estimate for this bill from the Director of the Congressional Budget Office:

U.S. CONGRESS,  
CONGRESSIONAL BUDGET OFFICE,  
Washington, DC, July 9, 1999.

Hon. DON YOUNG,  
*Chairman, Committee on Resources,*  
*House of Representatives, Washington, DC.*

DEAR MR. CHAIRMAN: The Congressional Budget Office has prepared the enclosed cost estimate for H.R. 1753, the Methane Hydrate Research and Development Act of 1999.

If you wish further details on this estimate, we will be pleased to provide them. The CBO staff contact is Kathleen Gramp.

Sincerely,

BARRY B. ANDERSON  
(For Dan L. Crippen, Director).

Enclosure.

*H.R. 1753—Methane Hydrate Research and Development Act of 1999*

Summary: H.R. 1753 would authorize appropriations for a new research and development program at the Department of Energy (DOE) on the use of methane hydrate as a source of energy. DOE would administer the program through grants, contracts, and cooperative agreements with universities and industrial enterprises. Deposits of methane hydrate occur in deep ocean and permafrost areas of the world and consist of methane-water ice-like crystalline material.

CBO estimates that appropriating the specified amounts would increase discretionary spending by \$41 million over the next five years. H.R. 1753 would not affect direct spending or receipts; therefore, pay-as-you-go procedures would not apply. The bill contains no intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act (UMRA) and would not impose costs on state, local, or tribal governments.

Estimated cost to the Federal Government: The estimated budgetary impact of H.R. 1753 is shown in the following table. For purposes of this estimate, CBO assumes that H.R. 1753 will be enacted before the end of fiscal year 1999, that the authorized amounts will be appropriated for each year, and that outlays will occur at the rate observed for similar existing programs. The costs of this legislation fall within budget function 270 (energy).

	By fiscal year, in millions of dollars—				
	2000	2001	2002	2003	2004
SPENDING SUBJECT TO APPROPRIATION					
Authorization level .....	5	11	11	12	12
Estimated outlays .....	2	6	10	11	12

Pay-as-you-go considerations: None.

Intergovernmental and private-sector impact: H.R. 1753 contains no intergovernmental or private-sector mandates as defined in UMRA and would not impose any costs on state, local, or tribal governments. State universities might benefit from research grants, contracts, or cooperative agreements provided through this bill.

Previous CBO estimate: On March 9, 1999, CBO transmitted a cost estimate for S. 330, the Methane Hydrate Research and development Act of 1999, as ordered reported by the Senate Committee on Energy and Natural Resources on March 4, 1999. Differences in the estimates are attributable to differences between the two bills. The Senate bill would authorize such sums as may be necessary for the program, which CBO estimated would total about \$45 million over the next five years. H.R. 1753 would specify authorizations totaling \$41 million for these activities over the 2000–2004 period.

Estimate prepared by: Kathleen Gramp.

Estimate approved by: Robert A. Sunshine, Deputy Assistant Director for Budget Analysis.

COMPLIANCE WITH PUBLIC LAW 104–4

This bill contains no unfunded mandates.

## PREEMPTION OF STATE, LOCAL OR TRIBAL LAW

This bill is not intended to preempt any State, local or tribal law.

## CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

In compliance with clause 3(e) of rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italic, existing law in which no change is proposed is shown in roman):

**SECTION 201 OF THE MINING AND MINERALS POLICY  
ACT OF 1970**

**SEC. 201. DEFINITIONS.**

In this title:

(1) \* \* \*

\* \* \* \* \*

(6) The term “marine mineral resource” means—

(A) \* \* \*

\* \* \* \* \*

(F) metal sulfides; **[and]**

(G) *for purposes of this section and sections 202 through 205 only, methane hydrate; and*

**[(G)] (H)** other marine resources that are not—

(i) oil and gas;

(ii) fisheries; or

(iii) marine mammals.

(7) *The term “methane hydrate” means a methane clathrate that—*

(A) *is in the form of a methane-water ice-like crystalline material; and*

(B) *is stable and occurs naturally in deep-ocean and permafrost areas.*

**[(7)] (8)** The term “Secretary” means the Secretary of the Interior.